

## Book Reviews

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*The Control of the Reactivity of Solids.* V. V. Boldyrev, M. Bulens and B. Delmon, Elsevier Scientific Publishing Co., Amsterdam—Oxford—New York, 1979. 226 pp., 68 figures, 25 tables, \$ 46.50

It is an important task and also a challenge to assess the present knowledge about the reactivity of solids. If excessive volume or a superficial treatment are to be avoided, the meeting of this challenge necessitates the choice of a certain predominant aspect. The sub-title of this book (published in the series "Studies in Surface Sciences and Catalysis") is "A Critical Survey of the Factors that Influence the Reactivity of Solids, with Special Emphasis on the Control of the Chemical Processes in Relation to Practical Applications". Thus, the selected aspect is that of how the modification of the solid reactant, the preliminary treatment, and the deliberate admixture of impurities with the solids change the reactivity (i.e. the rate and selectivity of processes). Other factors influencing the apparent rate of reactions, such as mass and heat transfer, are discussed only tangentially. Moreover, as the reader is advised in the Introduction, the discussion is centered around decomposition processes and gas—solid reactions, with occasional results from other fields, especially solid—solid reactions. In this way the scope of the book covers the field of solid-state chemistry with which the authors are most experienced, enabling them to summarize and assess the results in the field, besides reviewing the most important research work.

After the Introduction outlining the aims and contents, the basic kinetic and mechanistic background is given in Chapter II.

Chapter III., IV and V discuss changes in the reactivity of solids, depending on the bulk composition and structure, surface properties and heterogeneous inclusions, respectively. Some of the factors whose effects on the reactions are demonstrated: non-stoichiometry and impurities, solid solutions (Chapter III), "skin" composition, surface defects and geometry, mechanical treatment (Chapter IV), trapping of products, activation phenomena, carrier effects, etc. (Chapter V). In these chapters, the reduction of metal (Ni, Fe, Cu, etc.) oxides in hydrogen and the decomposition of various salts (ammonium perchlorate, azides, oxalates) are described in most detail from several point of view, but there are a number of other examples as well.

Chapter VI is devoted to the complex phenomena of coupling effects and the influence of radiations, while the last part (Chapter VII) presents the conclusions and practical prospects in the field.

The layout of the book, with literature references at the end of each chapter, is logical; due to the printing technique used, the style of production is simple and clear. "The Control of the Reactivity of Solids" is certainly a useful and relevant work for experts carrying out kinetic investigations with thermoanalytical methods, since the approach of modifying the solid reactant is not common enough in this field.

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